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ABSTRACT

This paper describes a computer-assisted instruction program which was used in a senior high school local government course. In the fall of 1978, a contract was worked out between four senior American government students who were also studying fifth year mathematics. In return for writing a computer program on local government, which would count as 25 percent of the second nine weeks grade in both classes, the students were given some release time from regular classroom activities in both the government and the mathematics classes. Some homework was also suspended for these students. The program was written in basic computer language for a TR8-80 Radio Shack Level II computer. The particular data statements were designed to question students on local county government. The computer logic, however, could be used in any other subject area and the teacher would only have to develop different data statements to fit the different subject area. The data for the local government course consisted of 99 questions--33 questions each of multiple choice, true or false, and fill in the blank. The program was used in various ways. For example, individual students used the computer for remedial work. The program has also been used as a pretest of the student's knowledge of local government. The program provides direct feedback since incorrect responses are immediately noted, students are given correct answers, and students are given page numbers in the textbook when they need extra help and information. The program has increased student interest in the course. (Author/RM)

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THE USE OF THE PORTABLE COMPUTER IN CLASSROOM INSTRUCTION

by

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Problems in the Use of the Computer

For the past twenty years, curriculum planners have projected that computers and computer based curriculum programs would be used as a viable means to aid in the school's instructional programs. Some computer based simulations such as "The Sumerian Game" and "Sierra-Leone" were devised whereby students could learn economic principles, principles of social interactions, and historical significances. One of the main problems of these computer based curriculum projects was that the classroom teacher had to have access to a computer terminal that was tied into a computer programmed for the particular activity. Such terminals were not available in most teacher's classroom. Hence, few teachers made use of the computer.

With the development of the portable computer, which is relatively inexpensive, computer based curriculum projects are becoming within the range of feasibility for many classroom teachers. However, the classroom teacher must have some knowledge of how to write learning activities for a program devised for the portable computer or have access to someone who can write such a program. Computer programming is a complicated process.

A Computer Program Devised at Troup County High School

A method for using students to write a computer program for use in a social studies class in local government was successfully carried out at Troup County High School, Troup County, Georgia. The study of local government is a five-week unit in a senior class of American government. Troup County is located in the western part of Georgia and lies adjacent to eastern Alabama. Troup County High School is located within the city limits of LaGrange, the county seat. The high school has 950 students who are drawn from the rural areas of the county as well as the surrounding areas of LaGrange, a growing industrial center.

In the fall of 1978, a contract was worked out between four senior government students who were also studying fifth-year mathematics. In return for formulating a computer program on local government, which would count as 25 percent of the second nine-weeks grade in both classes, the students were given some release time from regular classroom activities in both the government and the mathematics classes. Some homework was also suspended for these students. The mathematics teacher agreed to supervise the writing of the program while the social studies teacher supervised the information (questions and answers) for the data bank.

The school had a TRS-80 Radio Shack Level II computer. The program written by the students was for this computer. It was written in basic computer language. It used approximately 20K bytes. The program was stored on a good quality thirty minute cassette tape. The particular data statements were designed to question students on local county government. The computer logic (how the computer was programmed to function) could be used in any other subject area. The teacher would only have to develop different data statements to fit the different subject area.

The data for the program consisted of 99 questions. There were 33 questions each of multiple choice, true or false, and fill-in-the-blank. The computer would randomly select the order in which it would ask a particular type of question and then randomly select the question it would ask in this catagory. The first and second groups (multiple-choice and true or false) of questions would always contain eight questions each or a total of sixteen questions. The last group (fill-in-the-blank) would always contain nine questions. Thus a total of 25 questions would then be asked the student. In the multiple choice sequence, the computer would furthermore, at random, arrange the different responses. With this arrangement of questions, no student would receive the same test as would another student. The directions for answering the questions and the questions were displayed on a small video display screen. The answer for the particular question was to be typed in on a typewriter keyboard.

The following directions were written for the students to give directions for working with the computer:

> Directions for taking the exam. This is an exam to test your knowledge of county government. The test will consist of three types of questions, "true or false," "fill-in-the-blanks," and "multiple choice." There will be a total of 25 questions, eight from two of the groups will be chosen randomly as will the questions. You may take the test as many times as you like without having the same test.
> Note: Always press the "enter" key when: (1) you are entering "Y" (yes) or "N" (no) or try again responses; and (3) when you need another question.

You will be given a series of statements which are either "true" or "false." Read the question carefully, and then answer "T" or "F." You will be given only one chance to answer the question. Example: "You are a human being." If you answer "T," the computer will display a statement indicating you are correct. You will then be given another question. If you answer "F," the computer will indicate that you are incorrect, and you will be told on what page of your text the answer can be found.

"Fill-in-the-blank" questions are to be answered with short phrases or one word answers. The answer will be denoted by - - -. Check spelling carefully before entering your answer. Answers involving numbers should be written as the number, not spelled out (2, not two). You will be given two chances to answer the question if you miss it. You will then be given the correct answer if you miss twice or do not wish to try again. Example: "- - - - is the capital of Georgia." If you answer is "Atlanta," the computer will indicate your answer is correct, and you will be given another question. If your answer is "Columbus," the computer will display an error message and ask if you would like to try again. If you do, type in a "Y"; if not, type in an "N." The computer will act accordingly.

Multiple choice questions are to be answered with a "1," "2," "3," or "4." Make sure your choice corresponds to the number you enter. You will be given two chances to answer the questions. If you miss twice or do not wish to try again, you will be given the correct answer. Example:

"There are - - - - days in a week. (1) 5; (2) 6: (3) 7: (4) 8." If you answer "3," the computer will indicate your answer is correct, and you will then be given another question. If you answer "1," the computer will give you an error message. You will be asked if you would like to try again. If you do, type in a "Y"; if not, type in an "N." The computer will act accordingly. You will be given two chances to answer the question. If you miss twice or do not wish to try again, you will be given the correct answer. Now type in "run" to start the test.

Using the Computer Based Program

The Radio Shack TRS Level II computer, used at Troup County High School, takes up very little classroom space. It can easily be stored on a small table. This makes it most accessible for use by either individual students or by the entire class.

There are many ways the computer has been used in the teaching process. In the local government classes, individual students used the computer for remedial work. Since the program provides direct feedback, incorrect responses are immediately noted. Page numbers in the textbook are given for the source of extra help. Correct answers are also given to the student. Another advantage is that the student may work at his own pace.

The teacher also uses the computer program as a pretest of the student's knowledge of local government. The computer will seldom repeat the same order of questions. The answer responses are always arranged for each test. Thus an individual post-test can be given over the local government unit.

One method of the computer's use which has fascinated students is the process where small groups of students divide into teams and devise a game which uses the computer. Although a number of games have been devised, the most favorite game of these students is "baseball."

In "baseball" the class is divided into two teams. One student is selected to operate the computer. Another student keeps score. Bases are located in the room. The first team at bat sends a student to home base. The computer operator reads the question aloud as the batter sees it displayed on the screen. If the batter answers correctly, he moves to first base. An incorrect answer is an out. Three outs are allowed to each team. If a batter elects, he may remain at the computer for second, third, and fourth questions. Thus it is possible for a team to score not just singles but also doubles, triples, and homeruns. In the interest of time, no student is allowed more than fifteen seconds to answer a question. The team with the most runs wins the game.

One of the reinforcements for students provided by this computer program is the statements given to the student when a question is answered. When the student types the correct answer to a question, the computer is programmed to give a response such as: "Hey!!! That is the correct answer," "All Right!!! That is the correct answer," "I bet you guessed at that one, but you got it anyway," "That is right, but anyone could have gotten that one," "You are very smart. That is the correct answer." If the student missed the question, computer responses are: "You missed again," "Your answer is wrong," "Would you like to try again?" "The correct answer is found on page (page number given)." If the student is answering a number of questions correctly, such responses are: "Very good!!! That is (number entered) in a row!" "Now you have (number entered) in a row!" "(number entered) right without a miss. Great!!!"

The computer program has proved to be a valuable aid for increasing student interest in the course of local government which has resulted in greater student knowledge of local government. While the particular data statements (questions and answers) for the present program are designed for local government, the teacher plans to write data statements for other subject matter taught which could be used with the present program. Other teachers also plan to write data statements for their subject area which could also be used with the present program. With the portable computer, computer based education is "coming of age" at Troup County High School.